

**X(10650) $^\pm$** 

$I^G(J^P) = ?^+(1^+)$

## OMITTED FROM SUMMARY TABLE

Observed by BONDAR 12 in  $\Upsilon(5S)$  decays to  $\Upsilon(nS)\pi^+\pi^-$  ( $n = 1, 2, 3$ ) and  $h_b(mP)\pi^+\pi^-$  ( $m = 1, 2$ ).  $J^P = 1^+$  is favored from angular analyses.

NODE=M208

**X(10650) $^\pm$  MASS**

VALUE (MeV)	DOCUMENT ID	TECN	COMMENT
<b>10652.2<math>\pm</math>1.5</b>	1 BONDAR	12 BELL	$e^+e^- \rightarrow$ hadrons
<b>• • •</b> We do not use the following data for averages, fits, limits, etc. <b>• • •</b>			
10657 $\pm 6$ $\pm 3$	2 BONDAR	12 BELL	$e^+e^- \rightarrow \Upsilon(1S)\pi^+\pi^-$
10651 $\pm 2$ $\pm 3$	2 BONDAR	12 BELL	$e^+e^- \rightarrow \Upsilon(2S)\pi^+\pi^-$
10652 $\pm 1$ $\pm 2$	2 BONDAR	12 BELL	$e^+e^- \rightarrow \Upsilon(3S)\pi^+\pi^-$
10654 $\pm 3$ $^{+1}_{-2}$	2 BONDAR	12 BELL	$e^+e^- \rightarrow h_b(1P)\pi^+\pi^-$
10651 $^{+2}_{-3}$ $^{+3}_{-2}$	2 BONDAR	12 BELL	$e^+e^- \rightarrow h_b(2P)\pi^+\pi^-$

<sup>1</sup> Average of the BONDAR 12 measurements in separate channels.<sup>2</sup> Superseded by the average measurement of BONDAR 12.

NODE=M208M

NODE=M208M

OCCUR=2

OCCUR=3

OCCUR=4

OCCUR=5

OCCUR=6

NODE=M208M;LINKAGE=BO

NODE=M208M;LINKAGE=BN

**X(10650) $^\pm$  WIDTH**

VALUE (MeV)	DOCUMENT ID	TECN	COMMENT
<b>11.5<math>\pm</math>2.2</b>	3 BONDAR	12 BELL	$e^+e^- \rightarrow$ hadrons
<b>• • •</b> We do not use the following data for averages, fits, limits, etc. <b>• • •</b>			
16.3 $\pm$ 9.8 $^{+6.0}_{-2.0}$	4 BONDAR	12 BELL	$e^+e^- \rightarrow \Upsilon(1S)\pi^+\pi^-$
13.3 $\pm$ 3.3 $^{+4.0}_{-3.0}$	4 BONDAR	12 BELL	$e^+e^- \rightarrow \Upsilon(2S)\pi^+\pi^-$
8.4 $\pm$ 2.0 $\pm$ 2.0	4 BONDAR	12 BELL	$e^+e^- \rightarrow \Upsilon(3S)\pi^+\pi^-$
20.9 $^{+5.4}_{-4.7}$ $^{+2.1}_{-5.7}$	4 BONDAR	12 BELL	$e^+e^- \rightarrow h_b(1P)\pi^+\pi^-$
19 $\pm 7$ $^{+11}_{-7}$	4 BONDAR	12 BELL	$e^+e^- \rightarrow h_b(2P)\pi^+\pi^-$

<sup>3</sup> Average of the BONDAR 12 measurements in separate channels.<sup>4</sup> Superseded by the average measurement of BONDAR 12.

NODE=M208W

NODE=M208W

OCCUR=2

OCCUR=3

OCCUR=4

OCCUR=5

OCCUR=6

NODE=M208W;LINKAGE=BO

NODE=M208W;LINKAGE=BN

**X(10650) $^+$  DECAY MODES** $X(10650)^-$  decay modes are charge conjugates of the modes below.

Mode	Fraction ( $\Gamma_i/\Gamma$ )
$\Gamma_1 \ Upsilon(1S)\pi^+$	seen
$\Gamma_2 \ Upsilon(2S)\pi^+$	seen
$\Gamma_3 \ Upsilon(3S)\pi^+$	seen
$\Gamma_4 \ h_b(1P)\pi^+$	seen
$\Gamma_5 \ h_b(2P)\pi^+$	seen

DESIG=1

DESIG=2

DESIG=3

DESIG=4

DESIG=5

NODE=M208225

NODE=M208R01

NODE=M208R01

**X(10650) $^\pm$  BRANCHING RATIOS**

$\Gamma(\Upsilon(1S)\pi^+)/\Gamma_{\text{total}}$	$\Gamma_1/\Gamma$
seen	BONDAR 12 BELL $e^+e^- \rightarrow \Upsilon(1S)\pi^+\pi^-$

NODE=M208R02

NODE=M208R02

$\Gamma(\Upsilon(2S)\pi^+)/\Gamma_{\text{total}}$	$\Gamma_2/\Gamma$
seen	BONDAR 12 BELL $e^+e^- \rightarrow \Upsilon(2S)\pi^+\pi^-$

NODE=M208R03

NODE=M208R03

$\Gamma(\Upsilon(3S)\pi^+)/\Gamma_{\text{total}}$	$\Gamma_3/\Gamma$
seen	BONDAR 12 BELL $e^+e^- \rightarrow \Upsilon(3S)\pi^+\pi^-$

NODE=M208R03

NODE=M208R03

$\Gamma(h_b(1P)\pi^+)/\Gamma_{\text{total}}$ 

<u>VALUE</u>	<u>DOCUMENT ID</u>	<u>TECN</u>	<u>COMMENT</u>	$\Gamma_4/\Gamma$
<b>seen</b>	BONDAR 12	BELL	$e^+ e^- \rightarrow h_b(1P)\pi^+\pi^-$	

NODE=M208R04  
NODE=M208R04 $\Gamma(h_b(2P)\pi^+)/\Gamma_{\text{total}}$ 

<u>VALUE</u>	<u>DOCUMENT ID</u>	<u>TECN</u>	<u>COMMENT</u>	$\Gamma_5/\Gamma$
<b>seen</b>	BONDAR 12	BELL	$e^+ e^- \rightarrow h_b(2P)\pi^+\pi^-$	

NODE=M208R05  
NODE=M208R05**X(10650) $^\pm$  REFERENCES**

BONDAR 12 PRL 108 122001

A. Bondar *et al.*

(BELLE Collab.)

NODE=M208

REFID=53963